

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Condrashoff

Appeal No. _____

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|------------------|---|-------------------|------|
| Applicant: | Robert S. Condrashoff et al. | Confirmation No.: | 4456 |
| Serial No.: | 10/710,457 | | |
| Filed: | July 13, 2004 | | |
| Examiner: | Rudy Zervigon | | |
| Art Unit: | 1716 | | |
| Title: | ULTRA HIGH SPEED UNIFORM PLASMA PROCESSING SYSTEM | | |
| Attorney Docket: | NOR-1193 | | |

Cincinnati, OH 45202

April 27, 2009

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
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Sir:

BRIEF ON APPEAL

I hereby certify that this correspondence for Application No. 10/710,457 is being electronically transmitted to Technology Center 1716, via EFS-WEB, on April 27, 2010.

/William R. Allen/
William R. Allen, Reg. No. 48,389

April 27, 2010
Date

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BRIEF ON APPEAL

I. Real Party in Interest

The real party in interest is Nordson Corporation of Westlake, Ohio, which is the assignee of the present invention.

II. Related Appeals and Interferences

There are no related appeals or interferences known to Appellant or to Appellant's legal representative that will directly effect or be directly effected by or have a bearing on the decision of the Board in the present appeal.

III. Status of the Claims

Claims 1-7, 11-15, 17, and 18 are pending. Claims 1-7, 11-15, 17, and 18 are rejected, claim 2 is withdrawn, and claims 8-10, 16, 19, and 20 are cancelled. Claims 1-7, 11-15, 17, and 18 are now on appeal.

IV. Status of Amendments

An Amendment was filed by the Appellant on April 26, 2010 and subsequent to the final Office Action dated September 17, 2009, but has yet to be acted upon by the Examiner.

V. Summary of Claimed Subject Matter

Appellant's independent claim 1 is directed to an apparatus (10) for processing a substrate (55) with a plasma. *See* generally Figs. 1-7; paragraphs 21-48. The apparatus 10 comprises a first electrode (24), a second electrode (22), and a separating member (26) directly contacting the first electrode (24) and directly contacting the second electrode (22). *See, e.g.*, paragraph 21. The separating member (26) forms a sidewall extending from the first electrode (24) to the second electrode (22). *See, e.g.*, paragraph 38. The separating member (26) is composed of a dielectric material capable of electrically isolating the first electrode (24) from the second electrode (22). *See, e.g.*, paragraphs 38-40. The apparatus (10) further comprises a processing region (40) formed by the separating member (26), the first electrode (24), and the second electrode (22). *See, e.g.*, paragraph 37. A process gas port (108) is provided for introducing a process gas to the processing region (40). *See, e.g.*, paragraphs 46-47. A vacuum port (66, 68) in the first electrode (24) is used for evacuating the processing region (40) to a sub-atmospheric pressure suitable for generating the plasma from the process gas in the processing region (40). *See, e.g.*, paragraphs (26), 41-44. The apparatus 10 further comprises an electrically conductive shell 12, 14, 16, 62 surrounding the first electrode (24), the second electrode (22), and the separating member (26), and an atmospheric pressure space (56, 58) between the shell (12, 14, 16, 62) and the first electrode (24), the second electrode (22), and the separating member (26). *See, e.g.*, paragraph 33; Figs. 3A, 3B.

Appellant's independent claim 15 is directed to an apparatus (10a) for plasma processing a substrates (55). *See* generally Figs. 8-9; paragraphs 51-58; *see also* Figs. 1-7; paragraphs 21-48.

The apparatus (10a) comprises a first electrode (24), a second electrode (22) positioned with a spaced apart relationship relative to the first electrode (24), a third electrode (130) positioned between the first electrode (24) and the second electrode (22), a first separating member (132) directly contacting the first electrode (24) and directly contacting the third electrode (130) forming a first sidewall extending between the first electrode (24) and the third electrode (130), and a second separating member (26) directly contacting the second electrode (22) and directly contacting the third electrode (130) forming a second sidewall extending between the second electrode (22) and the third electrode (130). *See, e.g.*, paragraphs 51-55. The first separating member (132) comprises a dielectric material for electrically isolating the first electrode (24) from the third electrode (130) and the second separating member (26) comprises a dielectric material for electrically isolating the second electrode (22) from the third electrode (130). *See, e.g.*, paragraphs 51; 38-40. A first processing region (40b) is formed by the first separating member (132), the first electrode (24), and the third electrode (130), and a second processing region (40a) is formed by the second separating member (26), the second electrode (22), and the third electrode (130). *See, e.g.*, paragraphs 52, 54. The first electrode (24) is configured to support one of the substrates (55) in the first processing region (40b) for plasma processing, and the second electrode (22) is configured to support one of the substrates (55) in the second processing region (40a) for plasma processing. *See, e.g.*, paragraph 56. At least one process gas port (108, 144) is provided for introducing a process gas to the first processing region (40b) and second processing region (40a). *See, e.g.*, paragraphs 57; 46-47. A vacuum port (66, 68) in the first electrode (24) is used for evacuating the first and second processing regions (40a, 40b) to a sub-atmospheric pressure suitable for generating the plasma from the process gas in the first processing region (40b) and the second processing region (40a). *See, e.g.*, paragraphs 26, 41-44, 54. An electrically conductive shell (12, 14, 16, 62, 134) surrounds the first electrode (24), the second electrode (22), the third electrode (130), the first separating member (132), and the second separating member (26), and an atmospheric pressure space is located between the shell (12, 14, 16, 62, 134) and the first electrode (24), the second electrode (22), the third electrode (130), the first separating member (132), and the second separating member (26). *See, e.g.*, paragraphs 33, 53; Figs. 8, 9.

VI. Grounds of Rejection to be Reviewed on Appeal

1. Claims 1, 5, 6, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,251,216 to Okamura et al. in view of U.S. Patent No. 4,786,359 to Stark et al.

2. Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamura and Stark further in view of U.S. Patent No. 5,891,350 to Shan et al.

3. Claims 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamura and Stark further in view of U.S. Patent No. 5,711,811 to Suntola et al. and U.S. Patent No. 4,381,965 to Maher, Jr., et al.

4. Claims 4, 7, and 11-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamura in view of Stark and Shan and further in view of U.S. Patent No. 6,700,089 to Hirooka.

VII. Argument

Appellant respectfully submits that the Examiner's rejections of claims 1, 4, 5 and 9-13 is not supported on the record, and that the rejections should be reversed by the Board.

1. Claims 1, 5, 6, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,251,216 to Okamura et al. in view of U.S. Patent No. 4,786,359 to Stark et al.

The Examiner argues that claims 1, 5, 6, and 16 are unpatentable under 35 U.S.C. § 103(a) over the primary reference U.S. Patent No. 6,251,216 to Okamura et al. (hereinafter *Okamura*) and U.S. Patent No. 4,786,359 to Stark et al. (hereinafter *Stark*). Based upon the Supreme Court's decision in *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007), a *prima facie* showing of obviousness still requires that the Examiner establish that the differences between a claimed invention and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a). Such a showing requires that all claimed features be disclosed or suggested by the prior art. Four factors generally control an obviousness inquiry: 1) the scope and content of the prior art; 2) the differences between the prior art and the claims; 3) the level of

ordinary skill in the pertinent art; and 4) secondary considerations of non-obviousness, such as commercial success of products covered by the patent claims, a long felt but unresolved need for the invention, and failed attempts by others to make the invention. *KSR*, 127 S. Ct. at 1734 (quoting *Graham v. John Deere Company*, 383 U.S. 1, 17-18 (1966)) (“While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”).

Moreover, in *KSR*, the Court explained that “[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue” and “[t]o facilitate review, this analysis should be made explicit.” *KSR*, 127 S. Ct. at 1740-41 citing *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). But, not every combination is obvious “because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.” *KSR*, 127 S. Ct. at 1741.

As a result, after *KSR*, while there is no rigid requirement for an explicit “teaching, suggestion or motivation” to combine references, there still must be some evidence of “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does” in an obviousness determination. *KSR*, 127 S. Ct. at 1731.

Appellant respectfully submits that, in the instant case, the Examiner has failed to establish a *prima facie* case of obviousness as to claims 1, 5, 6, and 16, and as such, the rejection based upon *Okamura* and *Stark* should be reversed.

Independent Claim 1

Claim 1 sets forth “a vacuum port in said first electrode for evacuating said processing region”. The Examiner admits on page 3 of the September 17, 2009 Office Action that *Okamura*

fails to teach this claimed subject matter but then contends on page 4 of the September 17, 2009 Office Action that *Stark* teaches “a vacuum port (not shown; column 3, lines 20-30) in said first electrode (42; Figure 4; column 3, lines 40-45) for evacuating said processing region (inside volume 25)”.

The passage from *Stark* cited by the Examiner discloses that the “lower electrode 42 can comprise suitable passageways, known per se in the art, for controlling the temperature thereof”. Appellant cannot locate a reference numeral 25 for a volume that the Examiner identifies in *Stark*. Nevertheless, *Stark* fails to disclose that the passageways in the lower electrode (42) act as a vacuum port for a processing region (that is identifiable as the region generally between the electrodes (42, 43) in *Stark* in which the wafer (44) is processed) or that these passageways in the lower electrode (42) are used in any manner to evacuate this processing region.

When the *Graham* factual inquiries are considered, an unresolved difference remains between independent claim 1 and the combined disclosure of *Stark* and *Okamura* that is alone sufficient to preclude a *prima facie* case of obviousness. For this reason alone, reversal of the Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a) is therefore respectfully requested by the Appellant.

The Examiner's motivation stated on page 5 of the September 17, 2009 Office Action to modify *Okamura* based upon *Stark* is “for generating lower pressure prococesses (sic)”. However, a person having ordinary skill in the art would appreciate that the passageways characterized by *Stark* as used for cooling the electrode could not be modified for use as a vacuum port to evacuate a processing space in *Stark*.

First, modifying the passageways to form a vacuum port would change the principle of operation of *Stark* because the passageways in the lower electrode (42) could no longer be used to cool the lower electrode (42). Instead of containing a circulated cooling fluid that would extract heat from the lower electrode (42) by conduction to cool it, the passageways in the lower electrode (42) would be evacuated to a sub-atmospheric pressure and could no longer contain a substance that would extract heat from the lower electrode (42). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re

Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). The modification proposed by the Examiner changes the principle of operation of the passageways in the lower electrode (42).

Second, even if the passageways in the lower electrode (42) in *Stark* were modified for use as vacuum ports (which Appellant disputes is an objectively reasonable modification), the wafer (44) and ring (46) cover the surface of the lower electrode (42) through which the passageway would emerge with an opening. Hence, the opening to such passageways in the lower electrode (44) would be blocked by the wafer (44) and ring (46). Due to the blockage, the modified passageways could not function as vacuum ports that could generate, as alleged by the Examiner, a lower pressure process.

Third, on page 17 of the September 17, 2009 Office Action, the Examiner alleges that the “proposed combination would necessarily function in the manner that both *Okamura* and *Stark* teach as disclosed”. This is not a correct characterization of *Okamura* if modified as proposed by the Examiner. The Examiner purports to identify a teaching in *Stark* that would relocate the vacuum port (22) of *Okamura*. However, *Stark* fails to disclose that the passageways in the lower electrode (42) of *Stark* can be coupled with a vacuum pump or that the passageways in the lower electrode (42) of *Stark* can otherwise be used to evacuate the processing region in *Stark*. This is the epitome of a loss of functionality in *Okamura* because the Examiner is replacing a functional vacuum port (22) in *Okamura* with a structure from *Stark* that *Stark* fails to disclose is capable of functioning as a vacuum port and that a person having ordinary skill in the art would not have modified to function as a vacuum port. The Examiner’s proposed modification (even if possible) would render *Okamura* unsatisfactory for its intended purpose, which is not permitted under MPEP § 2143.01. The Examiner is attempting to modify the vacuum port (22) in *Okamura* to produce a non-functional structure.

Consequently, when claim 1 is considered as a whole, the Examiner’s reasoning to modify *Okamura* based upon *Stark* is insufficient to support a *prima facie* case of obviousness. For this additional reason, Appellant respectfully requests that the Board reverse the Examiner’s rejection of independent claim 1 under 35 U.S.C. § 103(a).

Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion

of obviousness. In re Kahn, 441 F.3d 977, 988 (CAFC 2006). The Examiner fails to supply a line of objective reasoning explaining how the passageways in the lower electrode (42) of *Stark*, which the Examiner contends corresponds to the claimed vacuum port, could be modified for use in evacuating a processing region in *Stark*. Not only would the passageways in *Stark* have to somehow be modified to have an opening that communicates with the processing region for wafer (55), but the openings to these modified passageways would be covered by the wafer (44) and ring (46). Instead of an objective line of reasoning, the Examiner offers a conclusion that the proposed modification to *Okamura* based upon *Stark* is motivated “for generating lower pressure processes (sic)”.

On page 17 of the September 17, 2009 Office Action, the Examiner refutes the Appellant’s rebuttal arguments regarding the Examiner’s proposed modification to *Okamura*. The Examiner states that “the Examiner has not made any reference to any of the suggested alterations or results Applicant has proposed above”. This is incorrect. The Examiner alleges in the Office Action that a vacuum port (22) is disclosed in *Okamura*. The Examiner recognizes in the Office Action that the vacuum port (22) of *Okamura* is not located in either of the electrodes (11, 13). The Examiner proposes in the Office Action to replace the vacuum port (22) of *Okamura* with the vacuum port that the Examiner alleges is present in the lower electrode (42) of *Stark*. This is the very modification that the Appellant is rebutting with objective reasons demonstrating why the Examiner’s attempted modification to *Okamura* is improper.

The Board should reverse the rejection of claim 1 for additional reasons, as discussed below.

In addition to the above, claim 1 also sets forth “an electrically conductive shell surrounding said first electrode, said second electrode, and said separating member” and “an atmospheric pressure space between said shell and said first electrode, said second electrode, and said separating member”.

The Examiner contends on page 5 of the September 17, 2009 Office Action that “it would have been obvious to one of ordinary skill in the art at the time the invention was made for *Okamura* to establish ‘an atmospheric pressure space’ between 25/10a interface *based on the process for making Okamura’s apparatus*”. *Okamura* discloses that “[t]he first embodiment is characterized in that the main members of the reaction chamber 10, namely, upper bottom 10a, lower bottom 10b,

sidewall 10c, sample stage 11 (except for the substrate holding portion 11a) and periphery of the upper electrode 13, are covered with synthetic quartz protective members 25". *See* col. 5, line 64 - col. 6, line 2. *Okamura* fails to disclose that there is any type of atmospheric pressure space between the protective members (25) and the main members (10a, 10b, 10c, 11, 13) of the reaction chamber (10).

Although claims can be given a broad interpretation during examination, the Examiner is required to stay within certain boundaries. One of those boundaries is that the claim interpretation must be "reasonable". *In re Morris*, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). It is clearly not reasonable to adopt an interpretation that is inconsistent with the written specification. *In re Baker Hughes, Inc.* 55 USPQ2d, 1149, 1153 (Fed. Cir. 2000) ("We therefore conclude that the Board adopted a construction of the claim beyond that which was reasonable in light of the totality of the written description, and therefore erred in construing the claims to include gaseous hydrocarbons."). Moreover, the "reasonable" interpretation must, in the final analysis, be one that comports with how one of ordinary skill in the art would interpret the claim. *In re Bond*, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990) ("It is axiomatic that, in proceedings before the PTO, claims in an application are to be given their broadest reasonable interpretation consistent with the specification . . . and that claim language should be read in light of the specifications as it would be interpreted by one of ordinary skill in the art."); *see also* MPEP § 2111.01. Appellant's claim cannot be construed so broadly as to permit the Examiner to rely on a conjectured atmospheric pressure space between the "25/10a interface" in *Okamura*. Appellant's specification discloses an atmospheric pressure space in the form of gaps (56, 58), which are visible in Figs. 3A, 3B, between the shell (12, 14, 16, 62) and the first electrode (24), the second electrode (22), and the separating member (26). As mentioned above, the text of *Okamura* fails to expressly disclose any gaps at the "25/10a interface" and the drawings of *Okamura* fail to show any such gaps exist between the protective member (25) and the main member (10a). The Examiner must be considering some type of microscopic roughness, which would not be visible in the drawings of *Okamura*, as producing a gap. However, when claim 1 is interpreted in light of Appellant's specification, such a construction by the Examiner is objectively unreasonable.

Rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). When claim 1 is considered as a whole, the Examiner's reasoning to modify *Okamura* based upon *Stark* is merely conclusory and lacks any "articulated reasoning with rationale underpinning" sufficient to support a *prima facie* case of obviousness. An unresolved difference remains between independent claim 1 and the combined disclosure of *Stark* with *Okamura* that is sufficient to preclude a *prima facie* case of obviousness. Specifically, *Okamura* fails to expressly or inherently disclose "an atmospheric pressure space between said shell and said first electrode, said second electrode, and said separating member". For this additional reason, Appellant respectfully requests that the Board reverse the Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a).

The Examiner states in the September 17, 2009 Office Action that "[m]otivation for *Okamura* to establish 'an atmospheric pressure space' between 25/10a interface based on the process for making *Okamura*'s apparatus is for reducing product-by-process manufacturing costs". This statement amounts to mere speculation and is not supported any objective evidence. Rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). The Examiner has failed to articulate any reasoning to connect the proposed modification to *Okamura* with the alleged reduction of "product-by-process manufacturing costs". This is no more than a mere unsupported conclusion by the Examiner. When claim 1 is considered as a whole, the Examiner's objective reasoning to modify to *Okamura* based upon *Stark* is improper and is insufficient to support a *prima facie* case of obviousness. For this additional reason, Appellant respectfully requests that the Board reverse the Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a).

Dependent Claims 5, 6, and 16

Claims 5, 6, and 16, which depend either directly or indirectly from independent claim 1, are not separately argued.

2. Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamura and Stark further in view of U.S. Patent No. 5,891,350 to Shan et al.

Claims 2 and 3, which depend either directly or indirectly from independent claim 1, are not separately argued.

3. Claims 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamura and Stark further in view of U.S. Patent No. 5,711,811 to Suntola et al. and U.S. Patent No. 4,381,965 to Maher, Jr., et al.

Claim 15

Appellant incorporates by reference the remarks made above regarding the impropriety of the combination of *Okamura* and *Stark*. *Suntola* and *Maher*, either alone or in combination, fail to remedy the deficiencies of *Okamura* and *Stark*.

The rejection of independent claim 15 should be reversed for additional reasons.

On page 11 of the September 17, 2009 Office Action, the Examiner “adds Suntola’s device (Figure 3) with Maher’s plasma generator means to Okamura’s apparatus”.

The framework for the objective analysis for determining obviousness under 35 U.S.C. 103, is stated in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966). One of the factual inquiries that is required under *Graham* to formulate a *prima facie* case of obviousness is to determine the scope and content of the prior art. As understood by the Appellant, the Examiner seemingly determines the scope and content of *Suntola* on pages 10 and 11 of the September 17, 2009 Office Action. However, another factual inquiry that is required under *Graham* to formulate a *prima facie* case of obviousness is to ascertain the differences between the claimed invention and the prior art. See MPEP § 2141. As the September 17, 2009 Office Action is understood, the Examiner has violated this rule by failing to articulate a difference between the claimed invention and the combined disclosure of *Okamura* and *Stark* that necessitated the Examiner’s use of the secondary reference *Suntola*. For this additional reason, Appellant respectfully requests that the Board reverse the Examiner's rejection of independent claim 15 under 35 U.S.C. § 103(a).

As discussed above, under *Graham*, the Examiner is required to ascertain the differences between the claimed invention and the prior art. In the September 17, 2009 Office Action, the Examiner fails to articulate a difference between the claimed invention and the combined disclosure of *Okamura* and *Stark* that necessitated the Examiner's use of the secondary reference *Maher*. The Examiner's entire analysis of the scope and content of *Maher* is set forth on page 11 of the September 17, 2009 Office Action – “a wafer plasma processing apparatus (Figure 4) including plural electrodes 19a,b-25a,b each interposed between insulating dielectric layers 19c-25c”. Each of the dielectric layers 19c-25c in *Maher* is actually disposed between two of the metallic plate electrodes 19a-25a, 19b,25b. See col. 6, lines 3-11. For example, dielectric layer 19c is disposed between the metallic plate electrodes 19a and 19b. Hence, the electrodes are not “each interposed between” the dielectric layers as the Examiner characterizes *Maher*. Because the sole relevant teaching from *Maher* that the Appellant can decipher from the Examiner's statement of the ground of rejection is the presence of multiple electrodes, Appellant must conjecture that the Examiner's use of *Maher* is to modify *Suntola* to modify the planar elements (32) of *Suntola* to be electrodes. However, the Examiner fails to explain how this would have been a predictable modification to *Suntola*.

On page 11 of the September 17, 2009 Office Action, the Examiner directs the Appellant's attention to column 1, lines 42-44 of *Suntola*, which is found within the Background Section of *Suntola*, in connection with “plasma processing as taught by *Suntola*”. However, this disclosure in *Suntola* applies to an abstract, hypothetical MBE or CVD reactor. Figure 3 and the associated written description of *Suntola*, which is relied upon by the Examiner to determine the scope and content of *Suntola* on pages 10 and 11 of the September 17, 2009 Office Action, fails to describe how the apparatus that is shown in Figure 3 can be used (or can be modified) to perform a deposition process involving a plasma. The disclosure at column 1, lines 42-44 of *Suntola* is not an enabling disclosure that would have taught a person having ordinary skill in the art how to modify *Okamura* based upon the disclosure in Figure 3 of *Suntola*. There is no other discussion of a plasma process in *Suntola* other than this isolated teaching in the Background that does not pertain to the device of Figure 3. A person having ordinary skill in the art would have failed to appreciate from the disclosure at column 1, lines 42-44 of *Suntola* that there is a reasonable expectation of success to

modify *Okamura* to treat multiple substrates. At least some degree of predictability is required. *Suntola* does not contain any enabling detail of how to modify a plasma processing device, such as the plasma processing device in *Okamura*, to treat multiple substrates.

Applicants submit that a person having ordinary skill in the art would have had no reason to modify *Okamura* based upon the disclosure in *Suntola* to process multiple substrates, as contended by the Examiner. Specifically, *Suntola* is directed to a system for depositing thin films by vapor phase deposition in a non-plasma atomic layer epitaxy (ALE) process. To process multiple substrates, *Suntola* stacks the substrates in multiple chambers (38) defined by a stack of planar elements (32). However, *Suntola* fails to disclose how the stacked planar elements (32) could somehow be modified to permit the processing of multiple substrates in a plasma deposition system. For example, *Suntola* fails to disclose or suggest how a person having ordinary skill in the art would connect the planar elements (32) in *Suntola* (which are made from an electrically insulating material) with a power supply in order to generate a plasma inside the chambers (38). Again, this modification to *Suntola* is not predictable. Even if the modification were made (which Appellant disputes is possible), the result would be a change in the principle of operation of *Suntola* from a non-plasma deposition process to a plasma deposition process. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

For this additional reason, Appellant respectfully requests that the Board reverse the Examiner's rejection of independent claim 15 under 35 U.S.C. § 103(a).

Dependent Claim 17

Claim 17, which depends from independent claim 15, is not separately argued.

4. Claims 4, 7, and 11-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Okamura* in view of *Stark and Shan* and further in view of U.S. Patent No. 6,700,089 to *Hirooka*.

Claims 4, 7, and 11-14, which depend either directly or indirectly from independent claim 1, are not argued separately.

VIII. Conclusion

In conclusion, Appellant respectfully requests that the Board reverse the Examiner's rejections of claims 1-7, 11-15, 17, and 18, and that the application be passed to issue. If there are any questions regarding the foregoing, please contact the undersigned. Moreover, if any other charges or credits are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,
WOOD, HERRON & EVANS, L.L.P.

Date: April 27, 2010

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APPENDIX OF CLAIMS

1. (Previously Presented) An apparatus for processing a substrate with a plasma, the apparatus comprising:

- a first electrode;
- a second electrode;
- a separating member directly contacting said first electrode and directly contacting said second electrode and forming a sidewall extending from said first electrode to said second electrode, said separating member composed of a dielectric material capable of electrically isolating said first electrode from said second electrode;
- a processing region formed by said separating member, said first electrode, and said second electrode;
- a process gas port for introducing a process gas to said processing region;
- a vacuum port in said first electrode for evacuating said processing region to a sub-atmospheric pressure suitable for generating the plasma from the process gas in said processing region;
- an electrically conductive shell surrounding said first electrode, said second electrode, and said separating member; and
- an atmospheric pressure space between said shell and said first electrode, said second electrode, and said separating member.

2. (Original) The apparatus of claim 1 further comprising:

- a vacuum manifold coupled with said vacuum port, said vacuum manifold being electrically isolated from said first electrode and said second electrode.

3. (Original) The apparatus of claim 2 wherein said vacuum manifold includes an enclosed volume proximate to said vacuum port and further comprising:

an insert of an electrically insulating material positioned inside said enclosed volume, said insert including a first plurality of passages coupling said vacuum manifold with said vacuum port.

4. (Original) The apparatus of claim 3 wherein said vacuum port is defined by a second plurality of passages extending through said first electrode and registered with said first plurality of passages.

5. (Previously Presented) The apparatus of claim 1 further comprising:

a vacuum pump coupled with said vacuum port and operative for evacuating said processing region to said pressure suitable for generating the plasma from the process gas in said processing region.

6. (Previously Presented) The apparatus of claim 1 further comprising:

a process gas supply coupled with said process gas port for introducing the process gas to said processing region.

7. (Previously Presented) The apparatus of claim 1 wherein said second electrode includes a plurality of openings arranged in a pattern effective for communicating process gas from said process gas port to said processing region.

8-10. (Cancelled)

11. (Previously Presented) The apparatus of claim 1 wherein said shell includes a base and a lid movable relative to said lid between opened and closed positions for accessing said processing region, said lid carrying said second electrode for movement relative to said base.

12. (Currently Amended) The apparatus of claim 1 further comprising a coolant port in said lid configured for supplying a flow of a coolant fluid to said atmospheric pressure space for cooling said first electrode and said second electrode.

13. (Previously Presented) The apparatus of claim 1 wherein said second electrode includes said process gas port.

14. (Previously Presented) The apparatus of claim 13 wherein said second electrode includes a plurality of gas openings coupled with said process gas port, said plurality of gas openings positioned in said second electrode to distribute process gas across a confronting surface of the substrate.

15. (Previously Presented) An apparatus for plasma processing a plurality of substrates, the apparatus comprising:

- a first electrode;
- a second electrode positioned with a spaced apart relationship relative to said first electrode;
- a third electrode positioned between said first electrode and said second electrode;
- a first separating member directly contacting said first electrode and directly contacting said third electrode forming a first sidewall extending between said first electrode and said third electrode, said first electrode configured to support one of the plurality of substrates in said first processing region for plasma processing, and said first separating member comprising a dielectric material for electrically isolating said first electrode from said third electrode;
- a first processing region formed by said first separating member, said first electrode, and said third electrode;
- a second separating member directly contacting said second electrode and directly contacting said third electrode forming a second sidewall extending between said second electrode and said third electrode, said second electrode configured to support one of the plurality of substrates in said

second processing region for plasma processing, and said second separating member comprising a dielectric material for electrically isolating said second electrode from said third electrode;

a second processing region formed by said second separating member, said second electrode, and said third electrode;

at least one process gas port for introducing a process gas to said first processing region and second processing region;

a vacuum port in said first electrode for evacuating said first and second processing regions to a sub-atmospheric pressure suitable for generating the plasma from the process gas in said first processing region and said second processing region;

an electrically conductive shell surrounding said first electrode, said second electrode, said third electrode, said first separating member, and said second separating member; and

an atmospheric pressure space between said shell and said first electrode, said second electrode, said third electrode, said first separating member, and said second separating member.

16. (Cancelled)

17. (Previously Presented) The apparatus of claim 15 wherein said second electrode includes a first process gas port configured for introducing the process gas to said first processing region and said third electrode includes a second process gas port configured for introducing the process gas to said second processing region.

18. (Previously Presented) The apparatus of claim 1 wherein said first electrode is adapted to support the substrate in said processing region.

19-20. (Cancelled)

APPENDIX OF EVIDENCE

(None)

APPENDIX OF RELATED PROCEEDINGS

(None)